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UNITED STATES DEPARTMENT OF AGRICULTURE

BULLETIN No. 582

OFFICE OF THE SECRETARY
Contribution from the Office of Farm Management
W. J. SPILLMAN, Chief

Washington, D. C. ▼ January 7, 1918

FARM MANAGEMENT AND FARM PROFITS ON IRRIGATED LAND IN THE PROVO AREA

(UTAH LAKE VALLEY)

By

L. G. CONNOR, Assistant Agriculturist

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The farm-management survey discussed in this bulletin was made in 1914 to check the results secured in a similar study[1] conducted in the same area during the previous year. The object of these surveys was to determine, approximately, the profits that farmers receive, or may reasonably expect to receive, in the irrigated areas of the intermountain region. (See Pls. I and II.) New data were collected with which to make a more complete analysis of the farm as a business enterprise in an effort to ascertain the factors which apparently control the income of the farmers in the above areas.[2]

SOURCE OF DATA.

Farm-management survey records were secured from 106 farms. Two of these were discarded, as one operator secured nearly three-fourths of his total receipts from outside labor and the other virtually conducted a lodging house. The 104 records used in this bulletin are

[1] Bulletin 117, U. S. Dept. of Agriculture.

[2] Many thanks are due the farmers who were interviewed in the prosecution of this study. A considerable portion of them had to put themselves to some inconvenience in furnishing complete data on the results of their year's work. Acknowledgment is hereby tendered them for their hearty cooperation and active interest in the work. Thanks are also due the various persons engaged in marketing the farm products of this section (particularly to Mr. Wm. Roylance), officials of the Forest and Reclamation Services, and to members of the staff of the Utah Agricultural College (particularly to Dr. R. J. Evans and Prof. J. T. Caine, III) for information supplied during the course of the study.

divided into the following classes: (1) Owners, (2) owners renting additional land, and (3) tenants. There are 75 records in the first, 22 in the second, and 7 in the third division. All the records were carefully checked a number of times, farms revisited one or more times when the records seemed inaccurate, and in some cases individual statements were sent back to farmers for them to recheck at their leisure, that the figures obtained might be more trustworthy.[1]

SUMMARY.

Following is a brief summary of the facts brought out by this study and of the conclusions drawn therefrom.

(1) The size of the farm business, the type of farming followed, and the diversity of income, each has an important bearing on profits. As regards size, the labor income from 26 small fruit farms and general farms averaged $350; for 29 large fruit and general farms, $598; and for 20 live-stock farms, $1,394. As regards type of farming, the labor income of 16 small fruit farms averaged $302; of 18 small general farms, $383; of 17 large fruit farms, $611; and of 24 large general farms, $646. Eighteen dairy farmers made an average labor income of $1,427, and three small poultry farms averaged $483.

[1] In order that the reader may readily follow the discussion, certain technical terms which are used are explained. It is necessary that the reader understand them thoroughly; otherwise the interpretation of the results may be somewhat difficult. These terms are as follows:

Farm capital.—The farm capital is one-half of the combined value at the beginning and at the end of the year of the value of all real estate, improvements, machinery, live stock, feed and supplies, and cash necessary to carry on the farm business. It includes the value of the farmhouse, but not of the household furnishings.

Receipts.—The farm receipts include the amount received from the sale of all farm products and also the receipts from outside labor, rent of buildings, etc. If the value of buildings, stock, produce, or equipment is greater at the end of the year than at the beginning, the difference is considered a receipt.

Expenses.—The farm expenses represent the amount of money paid out during the year to carry on the farm business. If the value of buildings, stock, produce, or equipment at the end of the year is less than at the beginning, this decrease is considered an expense. Household or personal expenses are not included, except the cost to the farmer of board furnished to hired help. The value of labor performed by members of the farmer's family for which no payment was given is charged as an expense.

Farm income.—The farm income is the difference between the receipts and expenses. It represents the amount of money available for the farmer's living, providing he has no interest to pay on mortgages or other debts.

Labor income.—The labor income is the amount that the farm operator has left for his labor after 5 per cent interest on the average capital is deducted from the farm income. It represents what he earned as a result of his year's labor after the earning power of his capital has been deducted. In addition to the labor income the operator received a house to live in, fuel (when cut from the farm), garden products, milk, butter, eggs, etc. The labor income corresponds to what a hired man receives when he is given so much wages in cash, together with board and room, or, in the case of a married hand, so much wages in cash, together with a house to live in, and produce from the farm for his kitchen. Interest at 5 per cent is deducted in order that the results secured may be compared with the results of similar surveys made in other sections where the prevailing rate on farm mortgages is 5 per cent or thereabout. Although the prevailing rate of interest on farm mortgages is 8 per cent in Utah (6 per cent in the case of money borrowed from the State), the farmers who rent land in this section pay a little more than 4 per cent on the average.

(2) The greatest need of the small farmers in this district is more land to work. Failing this, outside labor is a necessity if a good living is to be secured.

(3) Although in many cases a greater diversification is needed, on the small general farms this is not nearly as important as an increase in size of farm.

(4) The small orchardist should increase the area of his farm if possible and should also diversify. When he diversifies the fruit grower should do so with a crop or crops the market for which is more certain than for fruit. Under existing conditions one of the best methods for doing the latter is by the growing of sugar beets. Beans would also appear to merit much attention in this area.

(5) In general, so far as practicable, the farmer taking more land should do so by rent or lease, rather than purchase subject to a mortgage, as he can usually secure the use of the land for little more than half what must be paid on a mortgage. The money saved can be used for subsequent purchase. This, of course, does not apply to the man with cash in hand for immediate purchase.

(6) Some operators live in town and travel many miles a day to and from the farms. From a farm-management viewpoint this is an inefficient system.

(7) With land values and labor cost so high, and the marketing situation so complicated, farmers in this area should make every effort to keep at the maximum that part of the family living which is secured directly from the farm. The garden should be one of the regular enterprises and should be given adequate care.

(8) A further increase in the number of very small farms in this region would seem to be unwise. The operators of such units have not enough land to keep them busy at profitable work. About 30 acres seems to be the smallest size for efficient management without much reliance on live stock. Forty to fifty, preferably about 50 acres, seems to be the smallest unit for efficient management where live-stock enterprises are given a prominent place by the typical farmer. This is especially true of dairying.

(9) When feasible, live-stock enterprises may well be made a part of the farm business. The kind and extent will depend on conditions. Men at present engaged in dairying should replace poor cows with better animals. Pork production merits more attention than it now receives.

(10) In general, owing to market conditions, the proper place for orchard and truck products in this region is on general farms where they are used as fillers in the business as a whole. Certainly fruit should be produced only on farms where the orchard enterprises are supplemented in a substantial way by more extensive activities. The general farms which grow truck and fruit as secondary enterprises approximate the ideal cropping combination for this region.

PROFITS.

To facilitate this discussion the 75 records from farm owners were divided into three groups, as shown in Table 1.

The first group represents fruit and sugar-beet or truck farms, no one of which is as large as 27 acres, and most of them much smaller. The chief cash crops are fruit, beets, and truck, other crops being quite unimportant on these small units.

The second group comprises those farms of more than 27 acres in size, but on which practically the same crops are grown as on those in the first class. Productive live stock (usually stock other than work animals) is of but minor importance in either division. The men operating more than 27 acres derive a greater proportion of their crop receipts from grain, hay, and sugar beets than from fruit. Considerably more than half of the total receipts comes from the sale of crops in both of these groups.

The third group comprises the live-stock farms from which records were secured. Practically half of the total receipts on these farms comes from the sale of stock and animal products, while only a little more than a fourth of the total receipts comes from the sale of crops. The most important cash crop is the sugar beet, and fruit is a minor consideration if present. (See Table 7.)

TABLE 1.—*Average area, capital, receipts, expenses, farm income, and labor income on 75 farms operated by their owners. (Utah Lake Valley.)*

Item.	First group (26 small farms).	Second group (29 fruit and beet farms).	Third group (20 live-stock farms).	All farms.
Size of farms.....acres..	16.48	77.20	106.65	63.99
Tillable area per farm.....do....	15.04	56.64	68.06	45.26
Crop area per farm.....do....	13.34	46.05	47.81	35.18
Capital.....	$6,142	$13,337	$16,507	$11,688
Receipts.....	1,311	2,460	3,793	2,417
Expenses.....	654	1,195	1,574	1,105
Farm income.....	657	1,265	2,219	1,312
Labor income.....	350	598	1,394	728

From Table 1 it is seen that the average size of the 26 small farms is 16.48 acres, with 15.04 acres of tillable land and 13.34 acres in crops. The average labor income from the operation of these small farms is $350. In addition to this amount, the operator had the use of such products as the farm furnished toward the living of the family. If he had no mortgage on which interest had to be paid, the farmer had the total farm income ($657) for living expenses and savings against the inevitable "rainy day." The survey in 1913 showed that the farmers similar to those in group 1, Table 1, made a labor income of $247, or practically a sixth less than in 1914. In the latter year more than half of these men reported large receipts from outside labor, labor done off the farm when farm work is not

pressing, and when the time of both man and team would otherwise be largely wasted. The item of outside labor will be discussed in some detail later. The average receipts therefrom considerably more than account for the difference between the labor incomes of the farmers on small units as shown by the 1913 and 1914 surveys. One man in group 1 made a labor income of more than $1,000, seven of more than $500, and one had a minus labor income, i. e., he failed to pay interest on his capital, and got nothing for his year of farm work.

The second group of farms, 29 in number, is of the same general type as the first, but the average area is more than four times as large and the crop area more than three times as large, 46.05 as against 13.34 acres. The capital is a little more than double that of group 1, and the labor income two-thirds greater. Seven of these farmers made labor incomes of more than $1,000, 14 of more than $500, and 4 made minus labor incomes. They simply illustrate the fact that it takes money to make money, but that the more there is the more may be lost.

The third group of farms, 20 in number, comprises the live-stock units operated by owners. Two of these men breed and raise horses, four specialize in chickens, and the remainder conduct dairy farms. These operators produce for the home market almost exclusively. This type of farming is not yet overdone, but the possibilities for extension, except along certain lines, seem somewhat limited. The average labor income is $1,394.

The average labor income of all 75 owners ($728) compares favorably with labor-income figures secured in surveys made in other parts of the country.

TABLE 2.—*Average area, capital, receipts, expenses, farm income, and labor income on 22 farms operated by owners renting additional land. (Utah Lake Valley.)*

Item.	First group (8 small farms).	Second group (14 general farms).	All farms.
Size of farm.....acres..	20.03	113.25	79.35
Farm area owned.....do....	8.03	89.18	59.67
Additional area rented.....do....	12.00	24.07	19.68
Tillable area per farm.....do....	18.59	47.62	37.07
Crop area per farm.....do....	17.00	43.70	33.99
Capital.....	$3,597	$8,041	$6,425
Receipts.....	1,026	2,197	1,770
Expenses.....	448	1,095	859
Farm income.....	578	1,102	911
Labor income.....	398	700	590

Table 2 presents the results from 22 farms where the operator owns an area which he deems too small for profitable farm management and rents additional land to overcome this drawback. This method of operation is becoming more and more general here, as elsewhere, with the rise in land values. It represents a step midway between tenant and owner, and is very effective in enabling men with limited

capital to increase their labor incomes with but a small increase in their investment. The first group in Table 2, with but three-fifths as much capital as the small owners in Table 1 ($3,597 as against $6,142), made considerably more labor income ($398 as against $350). They raised but little fruit, devoting a large part of their crop area to sugar beets. The size of farm and the crop area is a little larger than with the men in group 1, Table 1.

The second division in Table 2 comprises 14 farms comparable to those of the same group in Table 1. One of these farms is operated by a man who owns considerable range land, which he is just beginning to improve, and who rents a small irrigated area in addition to a few acres of such land already owned. The crop area of these two groups is a proper measure for comparison. The average capital of these men renting additional land is $8,041 and the labor income $700. With less than two-thirds as much capital, they make practically one-fifth more labor income than the larger owners operating fruit and general farms. Four of these "renting owners" devote considerable attention to live stock. If they are omitted, the other 10, with a size of business but a little more than one-third as large as the operators in group 2, Table 1, make a labor income of $581. This is practically as large as that of the men with whom they are compared.

The last group in Table 2 shows the results for all the farmers renting land in addition to the area owned. These men are compared with the last group in Table 1, which presents the average for all farms operated by their owners. The owners had considerably more tillable land, owing to the inclusion in Table 2 of a unit composed largely of unimproved land which was just beginning to be brought under cultivation. The average tillable and crop area in the two classes under discussion is a proper measure of size. On somewhat smaller farms, and with a little over half as much capital as the average owner, the man renting additional land made an average labor income of $590, or nearly six-sevenths as much as that of the straight owners ($728). The greater proportion of live-stock farms run by owners accentuates the difference in labor income in their favor.

The average labor income of all the owners and owners with additional land rented is $697. The average capital is $10,096. This compares favorably with returns from a similar size of business in other parts of the country.

TABLE 3.—*Average area, capital, receipts, expenses, farm income, and labor income on 18 dairy farms. (Utah Lake Valley.)*

	Average.		Average.
Size of farm_____acres___	119. 46	Receipts_____	$4, 227
Tillable area per farm__do___	82. 88	Expenses_____	1, 872
Crop area per farm____do___	57. 46	Farm income_____	2, 355
Capital_____	$18, 562	Labor income_____	1, 427

Table 3 presents the average of all the dairy farms included in the survey. Not all are operated by owners, there being two tenant farms included and two which are operated by owners with additional land rented. These are all handled as though run by straight owners, the operators being charged with the landlord's expenses, credited with the corresponding receipts and interest on the landlord's investment deducted from the farm income to secure the labor income. Six of these farms sold butter or butter fat, 11 sold market milk, and 1 sold as much of one as of the other. The market-milk men averaged approximately $1.45 per 100 pounds for their product, while butter sold for 30 to 35 cents, and butter fat for 28 to 32 cents per pound. The men selling whole milk averaged somewhat larger labor incomes than the others, but their line of production is quite limited and the market for milk is already fully supplied except for a short time in late summer. One of the butter-fat farms, a large, well-managed unit, made a labor income better than most of these marketing the product as whole milk. The skim milk was fed to hogs, and the hogs were raised with a minimum of labor. The receipts from hogs largely account for the unusually high profitableness of this farm.

TABLE 4.—*Average area, capital, receipts, expenses, farm and labor income on seven tenant (rented) farms. (Utah Lake Valley.)*

Item.	Farm.	Tenant.	Landlord.
	Acres.		
Size of farm	89.08		
Tillable area per farm	79.11		
Crop area per farm	58.23		
Capital		$1,117	$17,469
Receipts		2,118	1,617
Expenses		1,050	589
Farm income		1,068	1,028
Labor income		1,012	
Per cent on investment			5,793

Table 4 presents the results secured from 7 farms operated by tenants. The tenants made a labor income of $1,012, and the landlords 5.79 per cent on their investment.

RENTING COMPARED WITH BUYING.

From the preceding tables and discussion it seems very clear that the man with limited capital should rent rather than buy land in this area. The prevailing rate of interest on farm mortgages is 8 per cent. The average owner of the 22 renting additional land had the use of $4,447 in real estate belonging to the landlords, and paid only 4.1 per cent for it ($182). The tenants paid less than 6 per cent on the average, but with only $1,100 owned capital they made labor incomes much larger than the men in Table 2 or in the first two groups in Table 1. The man with a small farm would do well to rent additional land and use the capital represented at a relatively

low rate of interest until he can buy outright, rather than borrow money at 8 per cent in order to buy. The savings from the operation of larger farms could perhaps be loaned at 8 per cent to trustworthy neighbors desirous of buying at the time, and thus earn double the interest which would have been paid if put into the bank.

So far as the writer was able to discover, recent purchases of farm land in the Provo area, when made by farmers who had acquired the money by farm operations, usually have been effected by men operating units larger than those in the first groups of Tables 1 and 2; that is, the small owners and small owners with additional rented land. In other words, these purchases have been made by men operating larger farms.

While a large part of the farm income in this section is available for living expenses and savings, practically all so available to the small operators is used for living expenses, and very little reaches the savings account in the bank. This is another argument in favor of the men with limited capital renting land rather than buying in this area at the present time. It enables them to farm a larger area.

DISTRIBUTION OF RECEIPTS.

Tables 5 and 6 present the distribution of farm receipts under the different headings. Practically six-tenths of the total receipts in the first two groups in Table 5 and the first in Table 6 come from crops. The second division of Table 6 agrees with the others if the four live-stock farms included in it are omitted. If the increase in inventory owing to new machinery bought and improvements made is excluded from the receipts and expenses, the proportion of receipts from crops in these groups is practically two-thirds of the total. In these divisions receipts from stock and stock products average low except in the second division of Table 6, which contains four live-stock farms. Without them this group does not vary from the others mentioned above. One-half of the percentage under "Increase of inventory" in groups one and two, Table 5, and group two, Table 6, are due to improvements and new machinery. Nothing under this head enters into the figure for the first division of the second table. The bulk of the miscellaneous receipts of the small operators and of the large owners (fruit and general farms) comes from outside labor.

The live-stock farms in Table 5 secure one-fourth of their receipts from crop sales, one-half from sales of stock and stock products, and virtually one-fourth from increase of inventory. One third of the last is due to new machinery and improvements.

The fourth group in Table 6 presents the distribution of the receipts for all 97 farms operated by owners and owners with additional

land rented. Nearly a half comes from the sale of crops, almost a fourth from stock and stock products, 5 per cent from miscellaneous (largely outside labor), and nearly a fourth from increase of inventory, about two-fifths of which are due to new machinery and improvements. Excluding the last item, the receipts on all 97 farms average $2,049 per farm, of which 51.2 per cent comes from crops, 5.1 per cent from stock, 21.7 per cent from stock products, 5.8 per cent from miscellaneous, and 16.2 per cent from inventory increase due solely to farm activities.

TABLE 5.—*Distribution of farm receipts on 75 farms operated by their owners. (Utah Lake Valley.)*

Source of receipts.	First group (26 small farms).	Proportion of total.	Second group (29 large fruit and beet farms).	Proportion of total.	Third group (20 live-stock farms).	Proportion of total.	Average (75 farms).	Proportion of total.
		Per ct.		*Per ct.*		*Per ct.*		*Per ct.*
Crops	$763	58.2	$1,481	60.2	$945	24.9	$1,089	44.6
Stock	51	4.0	103	4.2	198	5.2	110	4.9
Stock products	54	4.0	87	3.5	1,710	45.0	509	21.0
Miscellaneous (includes outside labor)	147	11.2	140	5.7	51	1.4	117	4.8
Increase of inventory (less decrease)	296	22.6	649	26.4	889	23.5	592	24.7
Total	1,311	100.0	2,460	100.0	3,793	100.0	2,417	100.0

TABLE 6.—*Distribution of farm receipts on 22 farms operated by owners with additional land rented. (Utah Lake Valley.)*

Source of receipts.	First group (8 small farms).	Proportion of total.	Second group (14 large general farms).	Proportion of total.	Average (22 farms).	Proportion of total.	Average for 75 owners and 22 owners with additional rented land.	Proportion of total.
		Per ct.		*Per ct.*		*Per ct.*		*Per ct.*
Crops	$653	63.7	$1,049	47.8	$905	51.2	$1,049	46.2
Stock	26	2.5	124	5.6	88	5.0	105	4.6
Stock products	32	3.1	336	15.3	225	12.7	444	19.6
Miscellaneous (includes outside labor)	144	14.0	106	4.8	120	6.8	119	5.2
Increase of inventory (less decrease)	171	16.7	582	26.5	432	24.3	554	24.4
Total	1,026	100.0	2,197	100.0	1,770	100.0	2,271	100.0

Table 7 presents the distribution of crop receipts on the various farm types. It is evident that fruit is an important crop. The receipts for fruit per farm are $387, or 36.9 per cent of the crop receipts. The small owners go in relatively more heavily for fruit than any of the others. Fruit is nearly as important in the second group of this table as in the first, but in the third group it becomes

quite secondary to other enterprises. Operators have been much discouraged in recent years over the outlook for fruit growing, especially peaches. The men not already on fruit farms do not feel that they can safely depend on such sources for their income. Accordingly the area of new plantings is small.

TABLE 7.—*Distribution of crop receipts on farms operated by their owners and on farms whose owners rent additional land.*

Source of crop receipts.	On 75 farms operated by their owners.								On 22 farms operated by owners renting additional land.						Average (97 farms).	
	First group (26 small farms).		Second group (29 fruit and beet farms).		Third group (20 live-stock farms).		Average (75 farms).		First group (8 small farms).		Second group (14 general farms).		Average (22 farms).			
	Per farm.	Proportion of total.	Per farm.	Proportion of total.	Per farm.	Proportion of total.	Per farm.	Proportion of total.	Per farm.	Proportion of total.	Per farm.	Proportion of total.	Per farm.	Proportion of total.	Per farm.	Proportion of total.
		Per ct.		Per ct.		Per ct.		Per ct.		Per ct.		Per ct.		Per ct.		Per ct.
Corn	----	----	----	----	$4	0.4	$1	0.1	----	----	----	----	----	----	$1	0.1
Potatoes	$57	7.5	$41	2.8	43	4.6	47	4.3	$87	13.3	$83	8.0	$85	9.4	56	5.3
Wheat	8	1.1	78	5.3	6	.6	34	3.1	39	6.0	49	4.6	45	5.0	37	3.5
Oats	----	----	5	.3	1	.1	2	....	----	----	22	2.0	13	1.4	5	.5
Hay	5	.6	100	6.7	20	2.1	46	4.2	4	.6	45	4.3	30	3.3	42	4.0
Beets	162	21.2	399	26.9	783	82.9	419	38.4	473	72.4	629	60.0	572	63.5	455	43.4
Truck crops	65	8.5	61	4.1	13	1.4	50	4.6	22	3.4	88	8.3	64	7.0	53	5.1
Apples	162	21.2	166	11.2	59	6.2	135	12.4	21	3.2	52	5.0	40	4.4	114	10.9
Peaches	175	23.0	230	15.6	5	.5	151	13.9	----	----	56	5.3	35	3.9	125	11.9
Other fruit	122	16.0	367	24.8	8	.9	187	17.2	7	1.1	25	2.5	19	2.1	148	14.1
Miscellaneous crops	7	.9	34	2.3	3	.3	17	1.6	----	----	----	----	----	----	13	1.2
Total	763	100	1,481	100	945	100	1,089	100	653	100	1,049	100	905	100	1,049	100

A person driving through this section in a casual way might come to the conclusion that fruit formed the chief product. In 1914, however, fruit contributed but one-sixth of the total farm receipts on the 97 farms of Table 7. Excluding dry-land farms the average size of 100 farms surveyed is 54.64 acres, with 5.22 acres in bearing fruit and 1.76 acres not yet in bearing. Fruit, bearing and not bearing, occupied only one-eighth of the farm area. On the whole, it seems just as well that the proportion is no larger.

The sugar beet is the most important cash crop for this area as a whole. (See Pl. III.) Nearly 50 per cent of the total crop sales on the 97 farms in Table 8 and a fifth of the total receipts were from beets. Those operators who rent additional land secure from three-fifths to three-fourths of their crop receipts from beets, and the live-stock farmers average more than four-fifths of their crop receipts from this source.

Sugar beets in Utah bring only a moderate price—$4.75 to $5 per ton—in most cases in the Provo area. But this price is steady. The

growers know what their beet crops will bring per unit; the uncertainty attending the marketing of the fruit crop is absent. With land values as high as is the case in this district and with the distance to outside markets so great, crops yielding a fairly high return per acre and capable of being marketed at home must command a large degree of attention. The predominance of the sugar-beet crop is therefore only to be expected. It is the mainstay of Utah farming in the irrigated areas. If for any reason this crop were to become permanently unprofitable, farm-management problems of the gravest kind would arise.

Table 8 presents data for a number of small farmers who specialize in sugar beets and grow little or no fruit. The importance of the sugar-beet crop in the Provo area is again made clear.

TABLE 8.—*Distribution of receipts from 16 sugar-beet farms. (Utah Lake Valley.)*

Item.	First group (8 farms operated by owners).	Second group (8 farms operated by owners renting additional land).	Item.	First group (8 farms operated by owners).	Second group (8 farms operated by owners renting additional land).
Size of farm.....acres..	16.33	20.03	Capital.....	$7,039	$3,597
Farm area owned.....do....	16.33	8.03	Receipts.....	1,140	1,026
Additional area rented..do....	.....	12.00	Expenses.....	414	448
Crop area.....do....	13.50	17.00	Farm income.....	726	578
Area in sugar beets.....do....	6.03	6.60	Receipts from outside labor...	166	135
Receipts from sugar beets, dollars.....	503.00	473.00	Labor income.....	374	398
Proportion of total receipts from crops.....per cent..	73.00	72.00			

The first group comprises the eight small farms of owners who specialized in this crop. Nearly half the crop area is in beets, which are raised on 6.03 acres. The labor income averages $374, of which $166 came from outside labor. The second group comprises the eight small owners with additional land rented. They have a larger area in crops and slightly more land in beets. Their labor income averages $398, of which $135 comes from outside labor. In both groups sugar beets brought in nearly half the total receipts and practically three-fourths of the crop receipts. The larger area cropped by the men in group 2 suggests that they have a slightly greater diversity of farm enterprises, which normally would tend to give a better labor income. It should be noted that the small owners with additional land rented have just half as much capital invested as the small owners, yet they manage more land and make better labor incomes than do the latter, and derive a larger percentage of their incomes from strictly farm operations.

DISTRIBUTION OF EXPENSES.

Table 9 presents the distribution of expenses under the various headings. Improvements and new machinery are a surprisingly large item. This was due in large measure to the erection of new dwellings or other buildings by some operators in four of the groups, to a considerable extent with borrowed money. The expense for labor is thus decreased to a little over one-third of the total expenses.

TABLE 9.—*Distribution of farm expenses on 97 farms (Utah Lake Valley).*

Item of expense.	On 75 farms operated by their owners.								On 22 farms operated by owners renting additional land.					
	First group (26 small farms).		Second group (29 fruit and beet farms).		Third group (20 live-stock farms).		Average (75 farms).		First group (8 small farms).		Second group (14 general farms).		Average (22 farms).	
	Per farm.	Proportion of total.	Per farm.	Proportion of total.	Per farm.	Proportion of total.	Per farm.	Proportion of total.	Per farm.	Proportion of total.	Per farm.	Proportion of total.	Per farm.	Proportion of total.
		Per cent.		*Per cent.*		*Per cent.*		*Per cent.*		*Per cent.*		*Per cent.*		*Per cent.*
Paid labor and board	$130	20.2	$244	20.4	$397	25.2	$245	22.3	$68	15.1	$206	18.8	$156	18.2
Family labor	61	9.5	192	15.2	218	13.9	154	14.0	38	8.5	110	10.0	84	9.8
Improvements and new equipment	143	22.2	283	24.6	267	17.0	231	21.0	.....	.....	218	19.9	138	16.1
Repairs	23	3.6	51	4.3	59	3.7	43	3.9	38	8.5	38	3.5	38	4.4
Feed	74	11.5	79	6.6	221	14.1	116	10.5	44	9.8	85	7.8	70	8.1
Horseshoeing	10	1.5	14	1.2	19	1.2	14	1.2	6	1.3	13	1.2	10	1.2
Seed and fertilizers	14	2.2	19	1.6	8	.5	15	1.3	5	1.1	12	1.1	10	1.2
Spray material	14	2.2	25	2.1	5	.3	16	1.4	2	.4	10	.9	7	.8
Machine work hired	20	3.1	30	2.5	43	2.7	30	2.7	31	6.9	32	2.9	32	3.7
Interest, taxes, etc	70	10.9	144	12.0	175	11.1	127	11.4	157	35.2	250	22.8	216	25.1
Miscellaneous [1]	41	6.4	80	6.7	65	4.1	60	5.4	16	3.6	52	4.8	38	4.4
Stock purchased	43	6.7	34	2.8	97	6.2	54	4.9	43	9.6	69	6.3	60	7.0
Total	643	100	1,195	100	1,574	100	1,105	100	448	100	1,095	100	859	100

[1] Includes decrease inventory.

Many operators pay members of the family for labor performed in rush periods at the same rate as is paid hired labor. The members of the family then buy their own clothes. Many men paid a substantial wage to grown or nearly grown sons for all work done on the farm. In these cases the labor was classed as hired labor.

The item for machine work hired relates principally to the seeding of the sugar-beet crop. The factory furnishes seed, machine, and labor, and charges $2.75 per acre. No attempt was made to segregate the actual cost of the seed, as the work is a contract job at a flat rate. The part of this item not covered by the beet seeding deals largely with grain-binder and drill hire and that of orchard sprayers. The areas in grain are usually very small, and the operators fully realize that it does not pay them to keep a drill or binder for such small acreages unless they can hire them out to their neigh-

bors. Much of the small grain is broadcasted by hand. The item under "Interest, taxes, etc.," is disproportionately high in the case of owners with additional land rented, because it includes cash rent.

THE FARM FAMILY—MORTGAGES.

In Table 10 are presented data on the age of the farmer, the size of the farm family, and the amount of the mortgage on the farm.

TABLE 10.—*Age of the farmer, amount of mortgage, and size of family on farms operated by their owners and on farms whose owners rent additional land. (Utah Lake Valley.)*

Farm group.	On 75 farms operated by owners.				On 22 farms operated by owners renting additional land.			
	Number of farms.	Age of operator.	Amount mortgage.	Number in family on farm.	Number of farms.	Age of operator.	Amount mortgage.	Number in family on farm.
		Years.				*Years.*		
Small farms	26	46.3	$304	5.1	8	40.6	$162	4.8
General and fruit farms	28	50.1	800	7.0	14	43.6	721	5.0
Live-stock farms	21	51.0	729	5.8				
Total and average	75	49.0	608	6.0	22	42.5	518	4.9

A very encouraging fact is the small size of the average mortgage on the farms reported in this survey. The amount of borrowed capital ranges (by groups) from 4.2 to 9 per cent of the total capital invested by the operators. The average for all 97 owners and owners with additional land rented is but 5.7 per cent of their total investment. This means that the average farmer of those visited in this particular survey has nearly the whole of his farm income for living expenses and savings.

With increased size of farm by groups (see Table 10) the age of the farmer increases. This appears to be the rule wherever farm-management surveys have been made. The average age of the owners is 49 years, while the average age of the owners with additional land rented is 42.5. A considerable difference in these ages is but natural. The owners with additional land rented are in a period of transition from tenancy to ownership. The seven tenant farmers in Table 4 average 33.7 years in age, as would be expected in a group representing a still earlier period in the transition from tenant to owner.

The size of the farm family averages large, just as in 1913. The tenant farmers average 4.4 persons per farm family as against 4.9 for owners with additional land rented, and 6 for the owners. The differences are largely due to difference in age of the farmers in these groups. In this connection it should be noted that the "farm family" contains only those members of the operator's family living at home. Members living elsewhere are not included.

The average value of the farm dwelling is $1,074, other houses $96, and other buildings $430. The buildings other than the dwellings are of low value on all but the dairy farms. In most cases, the dairy farmers have learned the greater efficiency of feed when the cow barns are fairly comfortable in the cold season.

WORK HORSES.

The data concerning the number of work horses per farm and the crop acres per horse are presented in Table II.

TABLE 11.—*Number of work horses and crop area per horse (Utah Lake Valley).*

Farm group.	Number of farms.	Number of work horses.	Crop area per horse.
			Acres.
Small farms	34	1.94	7.32
General and fruit farms	49	3.71	12.14
Live-stock farms	21	4.60	11.30
Total or average	104	3.31	10.98

The small farms have 1.94 work horses and only 7.32 acres of crops per horse. This shows a relatively low efficiency of the farm draft. The larger farms have an average of 11.89 acres of crops per horse, showing 62 per cent greater capacity in this respect. The average for all farms over 60 acres in size shows 70 crop acres and 4.76 work horses, or 14.7 crop acres per horse. The efficiency of the farm draft is double that in the case of the small farms. With the total cost of keeping a horse a year ranging from $70 to $100, the inefficient use of the farm draft on small farms represents an appreciable reduction of the labor income unless the horses can be used in idle periods at outside work.

With the cost of keeping a horse so high, an average charge of from nearly $10 to approximately $14 per acre would have to be made for horse labor per crop acre on the small farms, and just half as much on the farms over 60 acres in size. The average crop acres per horse for all farms was 10.98. The average charge per crop acre for horse labor would therefore range between approximately $6.40 and $9.

THE FARMER'S LABOR.

An estimate was obtained from each farmer on the value of the work done by him for that year. The average of all these estimates was $429, which is considerably higher than the average labor income earned by the small owner, or small owner with additional land rented. In other words, the operators in these two groups received less for their labor than they would have done had they worked out by the year for $429, plus a house to live in, and products of the farm

furnished by the employer for use in the kitchen. Their total yearly earnings would also have been greater if they had sold their farms, put out the money at 5 per cent interest, and hired out in this way.

The actual wages paid to dependable men by the year were frequently higher than the estimates of the farmers as to the value of their own year's work. These wages usually range from $420 to $480 per year.

INFLUENCE OF OUTSIDE LABOR ON LABOR INCOME.

In commenting on group one, Table 1, the fact was mentioned that outside labor was very important in increasing the labor income of the small operators in 1914. Table 12 is presented to show just how important this item really is.

TABLE 12.—*Importance of outside labor in increasing income on small farms. (Utah Lake Valley.)*

Item.	First group (15 small farms with 20 per cent or more of receipts coming from outside labor).	Second group (26 small farms [owners] showing amount of receipts from outside labor).	Third group (8 small farms [owners], with additional land rented, showing receipts from outside labor).	Fourth group (29 large fruit and beet farms [owners] showing receipts from outside labor).
Size of farm.....acres..	18.06	16.48	20.03	77.20
Crop area per farm.....do....	14.25	13.34	17.00	46.05
Capital.....	$5,362	$6,142	$3,597	$13,337
Receipts.....	$1,176	$1,311	$1,026	$2,460
Labor income.....	$430	$350	$398	$598
Receipts from outside labor.....	$301	$141	$135	$96
Percentage of labor income from outside labor.....	70	39	34	16

The total receipts here shown do not include receipts from increased inventory owing to new machinery bought or improvements made. The cash outlay for these items is credited as a receipt, and it is also debited as an expense. These items thus cancel each other. Many men made no improvements and bought no machinery in 1914. The farm receipts on all farms appearing in Table 12, therefore, are made perfectly comparable, both individually and by groups, by omitting the items in question from the receipts. This omission gives a figure which represents the receipts from the operation of the farm merely as a farm business, and not as affected by real estate operations or machinery increase. The labor income is in no way affected.

The first group in Table 12 comprises those operators whose receipts from outside labor amounted to 20 per cent or more of their total receipts. There are 15 such operators, 10 small owners, and 5 small owners with additional land rented. The average farm in this

class contained 18.06 acres of land, with 14.25 acres in crops. The capital invested was $5,362. The operator received $301 for outside labor, or 70 per cent of his labor income ($430). The men in this group had farms too small to keep themselves and their families busy. Accordingly, they sought outside employment in their spare time. Frequently an operator would send a son with the team to work on railroad construction. When this was done, the operator's team was credited with only half the wages received in most cases, as a well-grown son could command the other half. In each case as fair a division as possible was made of these receipts, and care was taken not to give undue credit for such items to the operator. One man worked at boiler making in the winter, another as a mill hand. One runs a thrashing machine, one is a school supervisor, and another is a landscape painter. Two men earned considerable money with their orchard sprayers. The remainder, and some of the above, did considerable hauling with their teams.

Group 2 in Table 12 presents the results for all the small owners. (See group 1, Table 1.) These men averaged $141 in receipts from outside labor, or more than one-third of their labor income. Group 3 shows similar results for the eight small farms operated by owners with additional land rented. (See group 1, Table 2.)

In the fourth division, Table 12, outside labor, while still important, figures much less prominently in the farm receipts, as less than a sixth of the labor income is derived from that source. These men did not make much more than the normal amount from such work. The average labor income for all the farms in groups 2, 3, and 4, 62 in number, amounts to $475. Twenty-five per cent of this labor income, or $120, comes from outside labor. The larger owners with additional land rented (see group 2, Table 2), the live-stock farmers (see group 3, Table 1), and the tenant farmers (see Table 4), had little or no time to engage in outside work. The labor on the farm kept these men busy, and their receipts from outside labor are practically negligible.

Table 12 simply shows how inadequate the small farm usually is to furnish sufficient labor for the operator and his family. The size of business on these small Utah farms is comparable with farms very much larger in area in nonirrigated sections, and the intensive type of farming followed on irrigated land calls for a labor supply commensurate with the size of business, but the operator and his family are often confronted with slack periods of considerable duration during the crop-growing season. The farms often are not large enough to permit a widespread adoption of enterprises which would call for labor in the idle periods. The small farmers in the Provo area took advantage of these periods of farm inactivity to earn large additions to their farm receipts in 1914. An interurban trolley

THE WASATCH MOUNTAINS NEAR PROVO.

A large part of the bench land, such as that in the foreground, is in fruit. Much of the fruit land was a short-grass and sagebrush desert 15 years ago.

IRRIGATED LAND IN THE PROVO RIVER BOTTOMS BETWEEN EAST BENCH AND PROVO BENCH.

The semiarid vegetation in the immediate foreground and on the bottom land in the right foreground shows the effect of absence of water. The land cultivated by the first settlers was in these bottoms.

FIG. 1.—LIFTING AND "TOPPING" SUGAR BEETS.

In this area the best crop is grown almost entirely on the rich bottom land near the lake, while the "bench" land at the foot of the mountains is devoted largely to fruit.

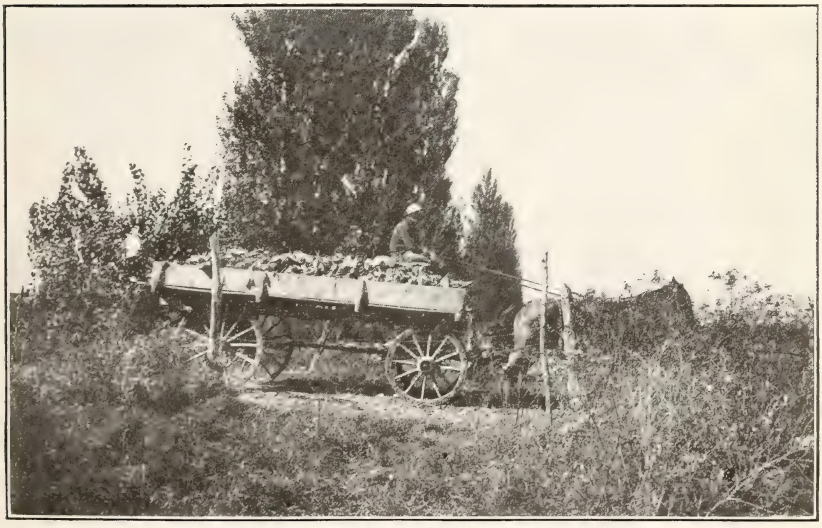

FIG. 2.—HAULING SUGAR BEETS TO THE SLICER.

Most operators use a two-horse or three-horse team on the beet rack.

FIG. 1.—A BROAD, SHALLOW, WEED-COVERED IRRIGATION DITCH—THE USUAL CONDITION.

It is exceedingly difficult to keep the land clean when every irrigation after midsummer deposits fresh weed seed.

FIG. 2.—A STRAWBERRY FIELD ON PROVO BENCH.

Bare spots in the rows indicate the presence of insect pests.

line which was built into Provo created a much greater demand for man and team labor than ordinarily exists in this section. The farmers in question took full advantage of this unusual condition. The receipts from outside labor thus averaged much higher than they would in a normal year; and these receipts, as already noted, increased the labor incomes by more than 50 per cent in the case of the small owners and small owners with additional land rented. This increase is certainly a compliment to the energy of these operators. It must be borne in mind, however, in dealing with the labor incomes of these men that the figures for 1914 are above normal and that the conditions which made this possible are not apt to recur. The average labor incomes as shown in the 1913 survey[1] ($247 for the small owners and $231 for the small owners with additional rented) probably are nearer the returns ordinarily secured on such farms.

RESULTS BY TYPE OF FARMING AS WELL AS BY SIZE.

In the preceding discussion the various details and the returns for work done have been presented by size of farm. In Table 13 are presented the vital details by size and by type of farming followed. This table is a digest of those which have preceded, with some additional data, and assembles the facts for all the farms for more convenient study.

In Table 13 the total acreage of crops grown does not quite check up with the crop acreage in line three, because the intervals in the young orchards are often planted in various crops, and hay is sometimes grown in the bearing orchards. All the farms are tabulated which can be used in the six classifications of (1) small fruit, (2) small general, (3) large fruit, (4) large general, (5) dairy, and (6) poultry farms.

In arriving at the amount of labor used the value of extra labor hired is all reduced to a man-time basis at $2 per day, the regular day wage. Such labor items include peach pickers (men), peach packers and berry pickers (girls), and the other miscellaneous labor used. Thus 10 peach packers averaging $1.20 per day each are equivalent to 6 men. Four boys earning 75 cents each per day at beet thinning are equivalent to 1.5 men. When members of the farm family work on other than a piece-work basis the value of their labor (above their board) is reduced to man time at the prevailing rate of wages for hands hired by the month. The amount of labor done by members of the family is practically the same in the first, second, and last groups, and in the three intermediate groups of the table. Although it is important at certain seasons, the actual

[1] Bulletin 117, U. S. Dept. of Agriculture.

amount of labor exchanged between neighbors is small, and it is mutually corrective between groups.

A minor, but a striking, factor bearing upon the labor used on all farms is the prevalence of abundant weed growths along the ditch banks. The fields are thus kept constantly seeded with weeds and are with difficulty kept clean. (See fig. 1, Pl. IV.)

TABLE 13.—*Labor used on different types of farm and the returns for labor.*

	Small fruit farms.	Small general farms.	Large fruit farms.	Large general farms.	Live-stock farms.	
					Dairy.	Poultry.
Number of farms	16	18	17	24	18	4
Average per farm:						
Acreage	17.47	17.18	51.2	62.08	119.50	8.87
Crop acreage	14.29	14.12	41.08	45.65	57.46	8.00
Capital	$6,248	$6,400	$13,915	$13,125	$18,562	$6,046
Crop sales	$804	$700	$1,630	$2,311	$1,088	$278
Stock sales	$62	$30	$206	$103	$235	$160
Stock product sales	$47	$50	$108	$146	[1] $1,745	$859
Miscellaneous receipts	$155	$140	$159	$105	$50	.....
Labor income	$302	$383	$611	$646	$1,427	[3] $483
Months of man labor used	17.24	14.46	24.57	20.29	30.75	15.15
Animal units	4.33	4.31	9.25	8.81	[2] 31.60	10.60
Grain—acres	1.80	3.33	4.78	15.25	12.11	2.50
Grain—bushels	68	140	196	467.50	527	110
Hay and fodder—acres	3.10	2.70	17.79	11.67	30	1.25
Hay and fodder—tons	9.66	8.50	52.40	37.42	102	5.25
Beets—acres	.38	5.42	.76	11.96	10.37	2.10
Beets—tons	6.00	86.20	10.60	182.92	194.25	41.30
Fruit—acres	6.51	1.70	14.55	3.80	2	1
Fruit—bushels	1,542	180	2,865	512.38	231.5	184.5
Nonbearing fruit—acres	1.94	.17	5.00	1.85	.35	.4
Other crops—do	1.56	1.58	1.77	2.98	3	.6
Crop area in intensive crops—per cent	72.7	62.8	53.8	45.1	27.5	51.2
Crop area per man—acres	10.0	11.7	20.1	27.0	22.3	6.34
Months of labor per crop acre	1.206	1.024	.598	.444	.537	1.894
Labor income per month of labor	$17.52	$26.48	$24	$31.83	$46.41	$32.54
Number of work horses per farm	1.9	1.97	3.7	3.4	5.2	1.5
Crop area per work horse—acres	7.52	7.17	11.10	13.43	11.01	5.33

[1] Receipts from dairy products.
[2] 17 milch cows.
[3] Omitting labor income of 1 exceptional farm, figure given is average for 3 units.

SMALL FRUIT AND GENERAL FARMS.

The crop area in the first two divisions of Table 13 is practically equal and the operators have the same number of live-stock units to look after. The small general farmer grows twice as much grain as the fruit grower, and has more than a third of the crop area in sugar beets, which are conspicuously absent on the small fruit farms. The orchardists have nearly a half of the crop area in fruit and more than an eighth in fruit not yet bearing. The men in group two have but little fruit. A few grow more than is needed for the family, while half of them grow none whatever. The general operator replaces fruit with sugar beets. The men on the smaller fruit farms use 17.2 man-months to care for their enterprises, or a fifth more than those on the small general farms. The difference in labor used represents almost entirely labor hired by the day or by the piece, and it alone is sufficient to account for the difference in labor income of the two groups. The orchardists have 10 crop acres per man and the general farmers 11.7. The number of work

horses and crop acres per work horse is substantially the same in both divisions. The men in the first group receive a labor income of $17.52 for each month of man labor used, while those in the second receive $26.48, or a half more. The latter uses less labor on the same size of farm, and to considerably greater monetary advantage.

LARGE FRUIT AND GENERAL FARMS.

The orchardists in group three, Table 13, use nearly a fifth more man labor than the general farmers in the fourth division. The latter have somewhat more land in crops, but this is offset by the larger percentage of intensively tilled land in the third classification. The orchardists have slightly more animal units, less than a third of the grain area, and 50 per cent more hay and fodder area than the general farmers. They grow considerable hay in the orchards, which thus often bear two crops, one of which is distinctly stable in character and is a valuable addition to the farm enterprises. Their beet acreage is almost nonexistent, while the men of group four devote more than a fourth of their crop acres to sugar beets. The fruit growers have more than a third of the tilled land in fruit and an eighth in fruit not yet bearing, while the general operators have about a twelfth of their cropped area in fruit and less than a twentieth in fruit not bearing. They have nearly twice as much land in miscellaneous crops as the men in group three. The fruit growers receive a labor income of $24 per month of man labor used, or a third less than the general farmers secure ($31.83) with the same size of farm and of business. The difference in the returns for labor is less on the two large types of farms because the large orchardists place more dependence on general crops than do the small fruit growers. The large, like the small general operators, use less labor than the fruit growers, but to greater advantage.

The men operating the large general farms, as well as those on the large fruit farms, pay some attention to live-stock enterprises, cows predominating. Receipts under this head form an appreciable though not a large item.

Only a few of these operators have enough pasture land to keep more than a few cows. The cows, which are usually bred to freshen in the spring, gather virtually all their feed until late in the fall, and owing to the character of the pasture (as well as the quality of the herds generally seen) the milk flow is not heavy and the lactation period is somewhat restricted.

Some orchardists keep one or more brood sows and feed the drop and cull fruit to the swine to good advantage.

SMALL POULTRY FARMS.

Four of the live-stock farms in group 3, Table 1, are poultry farms on very small areas. They are presented in column 6, Table

13. They averaged 8.9 acres in size, with 8 tillable acres, all in crops. Three of them averaged $483 in labor income. That of the fourth is not averaged, as he had a very profitable business, exceptionally well handled, and would raise the labor income for the four to a very misleading figure. Few men could hope to approximate his income, and many who have gone into the business carelessly as a result of his success have failed miserably. The significant fact in this group, however, is that with a quality of poultry business which many farmers could reasonably expect to attain, these three operators made a labor income almost two-thirds larger than did the small fruit growers, and more than one-fourth larger than did the small general operators. It is also significant that the men in all three small groups had the same size of business and that there was not much difference in the amount of labor used per farm. The poultry men netted nearly twice as much per month of labor used as did the small orchardists ($32.54, as compared with $17.52), and nearly a fourth more than the small general farmers ($32.54, as compared with $26.48).

DAIRY FARMS IN COMPARISON WITH LARGE FRUIT AND GENERAL UNITS.

The dairy farmers in Table 13 have considerably greater acreages in crops than the large orchardists and general farmers, while their total areas average twice as great as the average of the other two groups, the difference being due principally to the land used as pasture. The dairy farms have 3.5 times the number of animal units as the above two groups average (31.6, compared with 9), and 17 of these animal units are milch cows. The dairymen grow 12 acres of grain, 30 of hay, and 10⅓ of beets. Their orchard enterprises are largely for farm consumption, and the crop sales include little but beets, a little hay, milk or dairy products, calves, and considerable pork from farms producing butter. They use one-half more labor than the large general operators, and one-fourth more than the large orchardists. They grow one-tenth more crop acres per man than the fruit growers and one-fifth less than the general farmers. In addition, however, the regular labor used cares for about 15 animal units per man, and with the aid of the manure dropped secures a third larger yield per acre of grain, a ninth larger yield of hay, and a fifth larger yield of beets per acre than is secured by the operators in the other two groups of large farms. The men in column 5, Table 13, therefore, get more work done per unit of labor and the work is more efficiently done than is the case with these other two farm types. Their labor income per month of labor used is nearly twice that of the large orchardists ($46.41, compared with $24) and nearly 50 per cent greater than that secured by the general operators ($46.41, compared with $31.83).

The typical dairy farmer virtually adds 45 acres of pasture to the large general farm, curtails the grain area by a fifth, triples the hay area, slightly curtails the beet area, puts on nearly four times as many animal units, and runs the farm with 10 months' additional man labor. The only period when there is much spare time from field work and labor on live stock is during July and August. That period is generally used in laying tile drain. The weakest point in the system is the frequent presence in the dairy herd of cows which do not pay their way. Many farmers are remedying this as rapidly as possible.

DAIRY FARMS COMPARED WITH SMALL FRUIT AND GENERAL UNITS.

The dairymen grow twice as many acres of crops per man as do the small orchardists and their labor income per month of labor used is 165 per cent larger ($46.41, compared with $17.52). In comparison with the small general farmers they grow twice as many acres of crops per man and their labor income per month of labor used is 77 per cent larger ($46.41, compared with $26.48). The yield per acre of grain and hay secured by the dairymen is nearly a tenth larger than the average of the first two groups in Table 13, while the yield per acre of beets is a fifth larger than that secured by the small operators. In other words, these representatives of the "little farm well tilled" are not tilled as well as the dairy farms. It should be noted in this connection, however, that the poultry men in group six secure a slightly larger yield per acre of grain and beets, and a fourth larger yield of hay than is harvested by the dairymen. This, of course, is chiefly due to the large amount of highly concentrated manure which is available to the poultry man.

EFFECTS OF SIZE OF FARM AND TYPE OF FARMING.

The large orchardist secures a net return per month of labor which is $6.50 greater than is received by the small fruit grower, while the large general farmer secures a net return which is only $5.50 larger than that of the small operator on the same type of farm. The reason for the slightly smaller margin of advantage for the large general farmer is probably that both large and small operators of this type grow crops which suit the local marketing conditions, and the man on the small unit specializes to a greater extent on the most profitable crop, while the larger orchardists supplement their bulky, perishable special crops with considerable areas of general crops which have a ready market at home, a practice which the small orchardist can not follow. With larger farms, which utilize the family labor more fully, particularly in caring for standard field cash crops, the large orchardist would logically be expected to do relatively better than the small, as compared with the large and small general farmers, because the limited area of general crops grown by

the small orchardist barely fills the family flour barrel and the feed bin for the few head of live stock kept.

TABLE 14.—*Labor requirement of crops.*

[Days per acre.]

MAN LABOR.

Crop.	Winter, 96 days, 46 available.	Mar. 1 to May 1, 60 days, 35 available.	May 1 to July 1, 61 days, 42 available.	July 1 to Sept. 1, 62 days, 50 available.	Sept. 1 to Nov. 1, 61 days, 42 available.	Nov. 1 to Dec. 1, 30 days, 20 available.	Total.
Strawberries	1.50	0.17	[1] 36.04	2.67	.....	.....	[1] 40.38
Raspberries	1.50	8.17	7.33	[2] 44.00	.....	.....	[2] 61.00
Peaches	.....	6.24	1.75	3.13	[3] 22.00	0.50	[3] 33.62
Prunes	.....	5.88	3.20	.88	[5] 22.00	.50	[5] 32.46
Pears	.....	5.67	2.25	[6] 4.38	[6] 9.50	.....	[6] 21.80
Apples	.....	4.92	1.75	3.28	[7] 14.00	.....	[7] 23.95
Alfalfa	.....	.17	.83	1.03	.83	.....	[8] 2.86
Canning peas	.....	1.54	4.50	3.50	.....	.....	[9] 9.54
Small grain	.....	.82	.35	1.38	.....	.67	[11] 3.22
Snap beans	2.00	1.00	1.94	[12] 26.25	.....	.....	[12] 31.19
Tomatoes	1.50	2.10	5.07	[13] 15.67	[13] 12.00	1.00	[13] 37.34
Potatoes	1.50	2.90	2.09	1.15	[14] 4.00	1.00	[14] 12.64
Onions	1.50	3.17	5.84	2.67	[15] 21.20	3.66	[15] 38.04
Sugar beets	2.00	.97	3.97	1.75	[17] 6.25	1.00	[17] 15.94

HORSE LABOR.

Crop.	Winter.	Mar. 1 to May 1.	May 1 to July 1.	July 1 to Sept. 1.	Sept. 1 to Nov. 1.	Nov. 1 to Dec. 1.	Total.
Strawberries	3.00	.....	5.67	0.50	.....	.....	9.17
Raspberries	3.00	.....	1.67	6.00	.....	.....	10.67
Peaches	.....	2.81	1.67	1.50	[4] 5.00	1.00	[4] 11.98
Prunes	.....	3.14	3.28	.....	6.00	1.00	13.42
Pears	.....	1.67	1.33	1.00	3.00	.....	7.00
Apples	.....	2.50	1.00	.80	8.00	.....	12.30
Alfalfa	.....	.....	.95	.95	.95	.....	2.85
Canning peas	.....	2.63	4.00	4.00	.....	.....	[10] 10.63
Small grain	.....	1.30	.....	.73	.....	1.33	3.36
Snap beans	4.00	1.67	1.53	3.00	.....	.....	10.20
Tomatoes	3.00	1.27	2.28	4.75	4.00	2.00	17.30
Potatoes	3.00	2.47	1.08	.25	4.00	2.00	12.80
Onions	3.00	1.33	.50	.....	3.20	[16] 7.34	15.37
Sugar beets	4.00	1.60	1.53	.50	[18] 6.15	2.00	15.78

The figures in the above table include extra labor, mainly at harvest times, which in all cases, even when done by children, is reduced to the equivalent of man time. This extra labor is as follows:

[1] Extra days man labor, 22.68 in third column; 0.2 in other columns.
[2] Extra days man labor, 34.50 in column 4; 0.50 in other columns.
[3] Extra days man labor, 20 in column 5; 1.34 in other columns.
[4] Extra days horse labor, 3 (hauling).
[5] Extra days man labor, 17 in column 5; 2.28 in other columns.
[6] Extra days man labor, 8 in columns 4 and 5; 2 in other columns.
[7] Extra days man labor, 8 in column 5; 1.50 in other columns.
[8] Extra days man labor, 0.75, evenly distributed at each cutting.
[9] Total extra days man labor, 0.77.
[10] Total extra days horse labor, 0.2 (planting).
[11] Total extra days man labor, 0.80 (at harvesting and thrashing).
[12] Extra days man labor, 22.50 (picking by boys and girls).
[13] Extra days man labor, 18 in columns 4 and 5 (picking, mainly women and children); in other columns, 1.25.
[14] Extra days man labor, 2 (digging) in column 5; 0.9 in other columns.
[15] Extra days man labor, 13.60 in column 5 (harvest, mainly children); 5.33 in other columns, of which 4 are used in weeding before Sept. 1 (done by boys).
[16] Extra days horse labor, 2.67 (hauling).
[17] Extra days man labor, 5 in column 5 (harvesting), 1.97 in other columns includes thinning about June 1 (done by boys).
[18] Extra days horse labor, 3.75 (hauling beets).

The type of farming followed, as well as the size of business, is an important determining factor in the net return to the large orchardist, while in the case of the general farmers size of business is the chief factor in their net returns. The size of business is an im-

portant factor in the large net return on the dairy farms, but the type of farming appears of equal importance. Most of the labor used on these farms works longer hours than on the other types, and the labor is performed on enterprises all of which give good returns.

In connection with the study of Table 13 it doubtless will prove of interest to scrutinize Table 14 fairly closely. This table presents a highly condensed digest of the detailed labor requirements of the important crops grown on these farms. By consulting the footnotes a good idea can be secured of the demands on the time of the operator in producing the different crops.

POSSIBLE MODIFICATIONS FOR GREATER PROFIT.

ON SMALL FARMS.

It is evident from a comparison of Tables 13 and 14 that the small fruit and general farmers are not fully occupied during the crop-growing season, and the reasons for this also are plainly in evidence. The small orchardist grows but 14¼ acres of crops, of which nearly 3 acres are in apples, as much in peaches, a half acre in small fruits—6½ acres total fruit. The large orchardist, with 50 per cent more labor, cares for three times as many acres of crops, of which more than twice as many acres are in fruit. The small general farmer grows less than one-third as many acres of crops as the large general operator attends to with a little over one-third more labor. The question of the seasonal distribution of labor on these small farms is of minor importance, however, as labor, particularly harvest labor,[1] is quite plentiful in this district, and at the same time these small operators have not enough land to keep them busy except under systems of management much more intensive than would be wise in a region so far removed from the great markets. This is the great weakness with these two groups of farms, the lack of land to operate. It is not always easy to overcome. Only a sixth of the land included in this farm-management survey is rented land, though a fourth of the farmers interviewed rent part or all of the land they operate. With the land area as limited as is at present the case, the problem is to make the most of what is at hand and to grow as much as possible of the most profitable crops which are adapted to the region and its market facilities.

The typical small general operator in the Provo area, therefore, has to concentrate as far as possible on crops which give a high return per acre and on crops which can be marketed locally. As the market for canning crops (tomatoes, peas, and snap beans) is somewhat limited in this area, the sugar beet is left as the mainstay for most of these farmers. Many of them specialize on beets, producing

[1] The only important exception to this labor abundance is in seasons when peaches ripen with unusual rapidity. Some orchardists then have some difficulty in securing enough peach pickers.

little else for sale. When they can secure sufficient manure, many of the larger operators do the same. Some operators even omit alfalfa from their rotations and grow virtually nothing but beets and grain. The grain furnishes food for man and beast, sometimes brings in a small addition to the cash income, and enables the operator to trade the straw with town dwellers for equal volumes of manure from the town corrals. Manure needed for beets in addition to the farm supply and that secured as above is bought for about 25 cents per ton, loaded and hauled by the buyer. The manure keeps up the beet yield, and the operators apply enough to secure 16 or more tons per acre in most years. These men can concentrate on beets in this way because of the ample labor supply. Few farmers have difficulty in securing extra labor when needed for blocking and thinning and for harvesting the beet crop. The operator can grow nearly as large an area of beets as his supply of regular labor can perform the regular operations for, such as hoeing, cultivating, etc., or as he has land and manure for. These men are doing the logical thing in an area where there is plenty of labor, the market is sure, and the land area is limited. They buy the hay needed. Their system is sound as long as they do not crop with beets continuously, until trouble with beet diseases cuts down the yield per acre. The limiting factor in their system is the supply of manure.

More men would follow such a system as above if they could get the manure. It would seem probable that many more of them could follow such a system with the present supply of manure. In the absence of a good market for canning peas and snap beans, which would permit a greater relative concentration on beets because of the fertility they leave in the soil, reliance could be placed on edible dry beans. This crop leaves a large amount of immediately available fertility behind it. It also furnishes a considerable amount of roughage which is highly valued for live stock in bean-growing sections, particularly when fed with some good hay. The small farmer's bill for hay would be markedly decreased or possibly almost wiped out by growing a few acres of beans, and the same amount of manure would suffice for a much larger area of beets. At the same time, the small amount of extra labor needed for beans comes largely at a time when such labor is in relatively small demand. This fact, of course, is of more importance to the larger operators, and will appeal quite strongly to orchardists who have to pay a heavy bill for extra labor every year, extra labor used on crops which in many cases give but small net returns. The home market for beans would be quickly supplied, but the crop is easily stored or shipped, and is of sufficient value for its bulk to warrant a long shipment to market centers.

When a man is able to rent additional land, or owns a farm which approximates the upper limit of those in groups 1 and 2, Table

13 (27 acres), his problem is simpler, as with 22 to 24 crop acres he can retain alfalfa in his rotation and still concentrate on beets. The manure supply in this section is not specially large and many men do not care for the labor of hauling it in the winter, preferring to grow the forage crop. The alfalfa should be plowed up at intervals of not longer than four years to give fresh land for beets and thus minimize the danger of beet diseases. Whether the alfalfa is grown or not, it would pay to disk the stubble land as soon as the grain is stacked and sow a suitable green-manure crop, to be turned under late in the fall or in the following spring.

The small orchardist has a more difficult proposition than the general farmer. He is usually located on the benches, where the sugar beet does not take as kindly to the soil as on the richer bottom land. Many orchardists are turning to other enterprises, but this is not readily done when a large proportion of the land is in bearing fruit. The men who are striving to change are primarily the peach growers, as pears are distinctly a profitable crop with a fair yield and good care, prunes are next to pears for profitability, and apples usually are well ahead of peaches. Some men in a position to do so would do well to put in a small area of strawberries and raspberries, as these crops are largely supplementary to tree fruits, and give a good return per acre with a moderate yield (250 or more crates per acre). (See Pl. IV, fig. 2.) There would be something of a labor congestion before May 1 unless part of the orchard were summer or fall pruned, but on these small farms this labor conflict would not be serious. Any man setting out small fruits should take every precaution to secure healthy plants. It should be borne in mind, however, that the logical market for small fruits in Utah is in the intermountain country itself, and that overproduction would follow a marked extension of the area in these crops.

The peach grower would do well to cut out alternate rows of trees rather than chop them down indiscriminately, and set out prunes or pears in their place rather than small fruit. Should he desire to eliminate that part of the fruit area, and the farm were well situated for the hauling, he could profitably crop the intervals with sugar beets. With plenty of manure the yield is good, and half or more of the former orchard area could be in that crop. The beet harvest does not begin until the peach crop is gathered, and there is no labor conflict. With other tree fruits there is a conflict, but on these small farms this is usually a matter of small importance. Tomatoes also could be grown under the above conditions in spite of a labor conflict during the two weeks of peach harvest. With the labor of women and children as plentiful as is the case here, the only difficulty lies in the hauling, but judging from the experience of men who grow limited areas of both these crops on small units, this would not prove

a serious obstacle. Should a good market for canning peas and snap beans develop, these would be excellent enterprises for the orchardist, as the returns are high with fair crops ($40 to $45 per ton), and the labor is almost entirely noncompetitive with that for tree fruits.

When the farm is not favorably situated for hauling beets it would pay the small orchardist to rent land (preferably bottom land) which is so situated, in order to supplement the balance of the farm. He would be handicapped by the distance of the rented land from the farmstead, but a few acres of beets or other crops suggested would be a profitable addition to the farm enterprises. Although the farming of land in widely scattered fields is not conducive to the best farm management and should be discontinued when practicable, under some conditions (and within reasonable limits) such a system is preferable to the operation of a unit too small for profitable management.

A valuable addition to the enterprises of the small farmer, whether orchardist or general operator, should be the growing of edible dry beans. The labor on this crop is practically the same as for snap beans, except in the harvesting of the dry crop, which usually occurs the last of August or early in September. The labor need not interfere seriously with any other crops but small fruits. The peach grower could make excellent use of this enterprise by irrigating later than usual and keeping the plants green enough to permit harvesting after the peaches are gathered. The benches around Provo have good air drainage and there would be but slight danger from early frost. No labor conflict would occur with other tree fruits. When well cared for 25 to 30 bushels of beans per acre is a fair yield and $2.50 to $3 per bushel can generally be counted on for the crop. Overproduction can easily occur with beans, but the product can be stored indefinitely and is easily and safely shipped. So far as practicable the small orchardist should supplement his orchard activities with stable enterprises yielding a high return per acre. In most instances he already is overburdened with crops giving uncertain returns.

ON LARGE FARMS.

The large fruit and general farms present an entirely different problem from that of the small farms. Usually there is enough land to keep the operators fairly busy. The large fruit growers, with a little over a third more labor, care for more than twice as much fruit, bearing and nonbearing, and four times as much land in general crops as is the case with the small orchardists. Their field crops virtually serve as "fillers" for the periods when labor on the orchards is slack, but their labor income could be raised without much expense for other than harvest labor by the addition of limited areas of crops already mentioned. When the fruit harvest occupies most of the fall period, enterprises which require much time then would not do, and this eliminates tomatoes. Beets could be grown

if there were much slack after the latter part of September, as their harvest is intermittent. Some of the orchardists find them a very profitable addition to the cropping system when the farm is favorably situated for the hauling. With a good market for peas and snap beans they would make an excellent addition. Under the present market conditions dry edible beans would do nicely. Beans already are grown in very small areas by a few orchardists.

The large general farms use a little over a third more labor than do the small units of this type and grow more than three times as many acres of crops. The intertilled area is 2.5 times as large. Many men in this group, like some in the small-farm group, concentrate largely on beets, and have two-fifths to one-half of the cropped area devoted to them. Their labor incomes average two-thirds larger than the average for the group as a whole. Most of the large general farmers could increase their labor incomes without much extra expense for labor by the addition of enterprises which supplement those already present. There is danger in the combination of beets and tomatoes when these crops occupy a large area because after the first time over the tomatoes are picked continuously and must be hauled every day. If the available teams can not do this during the beet harvest and an extra team can not be hired, that part of the tomato crop which is neglected becomes a total loss. Canning peas and snap beans would make a valuable addition. In the absence of a demand for them dry edible beans are a good filler, as little or no extra labor would be needed and the harvest is finished before that of beets or the last haying begins, and the grain is all stacked before the labor on bean harvest starts.

Some of these general farms have orchard enterprises of a moderate size, usually apples. Owing to the character of the beet harvest, the labor conflict which seemingly results is not of much moment unless the area in one or the other of these crops is unduly large, as the harvesting of each crop is an intermittent activity.

LABOR IN DAIRYING.

As has already been shown, the dominant type of live-stock farming in the Provo area, and the most profitable type of farming, is dairying. Compared with the other types, the labor used on the dairy farms is much more evenly distributed throughout the year, and this is particularly true of the units which engage in winter dairying. Instead of being practically idle a large part of the time from December until March, the winter dairyman is profitably occupied during that time, while the hauling of beet pulp for succulent feed, and the spreading of manure, also keeps the horses fairly busy. The labor on live stock is heavy until the latter part of April, when the feeding of beet pulp ceases and the stock starts gathering the bulk

of the feed on pasture. The time required by the chores decreases perceptibly after the 1st of April, and rapidly after the 1st of May. The third cutting of alfalfa and 40 to 50 per cent of the beet harvest is finished before the labor on live stock becomes especially heavy in the fall, about the middle of October. Thereafter virtually the only field work on the typical winter-dairy unit is the remainder of the beet harvest and the daily cutting of green corn fodder from an acre or two of corn grown for succulent feed to be fed before fresh beet pulp is available (about November 1). With beet pulp available at 50 cents per ton there is no economy in feeding ensilage.

In one locality near Provo winter dairying is followed almost exclusively. The average size of a number of these farms is 155 acres, with 59 acres in crops. A large portion of the cropped area is in alfalfa (28 acres), beets (19.5 acres), and small grain (7.5 acres). These farms have an average of 40 animal units, of which 24 are milch cows and 6 are work horses. The other 10 represent young dairy and work stock, a few pigs, and a few chickens. The operator usually keeps a man by the year, and another from March until December unless he has one or more partly grown boys who can help with the field work in the summer. The boys also help with the labor on live stock throughout the year. The farmers in question have to hire considerable extra labor during beet harvest, and in May when that crop is blocked and thinned. Some exchanging of labor is also done, though very little. From 7 to 9 cows are milked per day per regular man during the crop-growing season. During March the regular men devote about 5 hours per day to field work. From about April 1 to early May 6 hours a day are spent in the field. From early May until the middle of October the farmers calculate on averaging 7 hours of field work a day per man. Extra labor hired puts in the regular field day of 8 to 8.5 hours. From the middle of October until the first of December the regular men do not average over 6 hours a day in the field. Thereafter the field work ceases and the second man, if more than one be hired, is laid off until March. From about November 1 to April 1 the total chores and labor on live stock, including hauling the milk not over 1.25 miles, require from 6.5 to 7 hours of man labor per day for each 10 cows in the dairy herd. From the middle of May until the middle of October this work consumes 4.5 to 5 hours per day. The number of cows in the different herds varies from 20 to 28, and the number of animal units from 32 to 50. During the winter the young stock is nearly always fed in the barnyard, and in the summer they require but little attention, as they are on pasture all the time. The operators start work at 5 to 5.30 in the morning the year round, and finish the evening chores at about 7 o'clock. Each regular

man looks after 12 to 16 animal units and on the average gets in at least three-quarters of a day in the field from April 1 to November.

POSSIBILITIES OF AN EXTENSION OF LIVE-STOCK ENTERPRISES.

DAIRYING.

Although the Intermountain region is, as a whole, somewhat sparsely settled, quite a field remains for an extension of live-stock enterprises. The demand for market milk is just about supplied at the present time, and the only period when there is an appreciable scarcity is in September. On the other hand, the local demand for creamery and cheese products is far from supplied. A rapid growth is now taking place in the creamery and cheese factory industry of the State and the output of the Utah factories is of very good quality. After the home product approximately meets the demand it seems only reasonable to look for further extension in the business, as cool or cold nights, abundant cold mountain water, and soil naturally adopted to alfalfa give the farmers in this region an appreciable advantage over dairymen in some other sections. It should be borne in mind, however, that the high freight rates which the Utah producers will have to pay to reach the large markets will necessitate the maintenance of a very efficient selling organization and a uniformly high standard of product to enable him to compete successfully with dairymen in regions more centrally located.

With the existing market for dairy products, men with moderate area of pasture land would be able to increase their labor incomes quite easily by the adoption of dairying if based on good cows. Although unusually efficient men with exceptionally good cows might be able profitably to adopt this enterprise entirely on the high-priced irrigated lands of this area by the use of artificially seeded pastures intensively stocked, the very moderate price received for the raw product (about $1.45 or less per hundred pounds for milk and 30 cents or a little better for butter fat) suggests that such a system of management might be unwise for most operators. When the high-priced irrigated land is farmed in connection with the cheaper pasture areas, however, a happy combination is found for the dairyman. For this reason the successful dairy farms in Provo district are located along the lake, where large areas of relatively cheap pasture land are found. These farms are fairly large, averaging 119 acres in size, of which a half are in crops.

Some men are doing fairly well on small farms, but none of these who make dairying a prominent enterprise operate less than 30 acres of land. This is nearly twice the average area in the first two groups of Table 13, the small fruit and general farms. In parts of the State where considerable surpluses of grain and hay are produced there may be quite a field for the development of the smaller, more in-

tensively stocked dairy units in the hands of very capable men, but owing to their lack of land, particularly of pasture, it does not seem practicable for most men on the smaller farms in the Provo area to engage in dairying.

It has been suggested that some men on the smaller farms might find it profitable to stock intensively with good cows and to dispense with pasture altogether, operating on the soiling system as is done in parts of Europe. To be profitable, such a system calls for high-producing cows, high-quality land, a high-priced product, and cheap labor. The last two requisites are not present in Utah. This plan might answer for a time with properly equipped men who have large families and little work for the children to do, but the supply of family labor is not permanent, and with present prices for the product the adoption of the soiling system of feeding, and intensive stocking in connection therewith, would appear to be an unwise procedure.

A profitable addition to the farm enterprises for men who sell butter fat, and for many who do not engage in dairying, would be the production of pork. The market for pork in Utah is considered nearly as good as within 200 miles of Kansas City or Omaha. When beet tops are available they make an excellent feed for swine, and not much else need be given from beet harvest until Christmas, or even until the latter part of January. The cheapest feed in summer and early autumn is alfalfa pasture. Some men are making pork on this system to excellent advantage.

POULTRY.

The most feasible live-stock enterprise for the small farms would appear to be poultry. The market for eggs is not yet fully supplied. Specialized poultry farms are sometimes quite profitable in favorable localities when the operator secures good egg production and high prices, but otherwise they rarely are profitable as a specialty. To have high egg production at the time of high prices requires good management, considerable experience, and a close attention to minor details of feed and care which does not appeal to many men. Therefore any expansion made in the poultry business should in most cases occur on farms of a more general character where the fowls are made distinctly a side line, where the necessary care is a minor item, and a large part of their keep is obtained from what otherwise would largely be wasted.

RANGE CATTLE.

When it is feasible, an enterprise which would appear to make a good addition to the farm business as a whole is a limited adoption of the range-cattle industry. Some men in the Provo area run cattle on the Wasatch and Uinta National Forests, or on other range back

in the mountains, wintering them on their farms. As a result of agricultural settlement, however, the area of the range has been slowly decreasing all over the State. A striking instance of this was the reclamation of a large part of Provo Bench subsequent to 1900. Until then this land was largely a cheat-grass and sage-brush desert used mostly for sheep pasture. Now it is preponderantly orchard land. The more recent encroachments on the range are in the mountain valleys, where the land is dry farmed and to some extent devoted to irrigated farming for general crops, with cattle or horses as an important enterprise. At present the National Forests in Utah are stocked to their full capacity, being more intensively grazed than those of any other State. Their carrying capacity shows a steady increase under the system of management in force, but this, of course, is a matter of slow growth. Many stockmen own considerable areas of range land, which is stated to be stocked to its capacity in most instances, as is the case with other privately-owned range. Most of the grazing land owned by the State lies within the National Forests and is fully stocked.

DETAILS OF THE RANGE-CATTLE ENTERPRISE.

The Utah farmers who at present make live stock (principally cattle) an important side line in the farm business run the stock on the range for 5.5 to 7 months, depending on the season and the locality. In the northern part of the State the range season usually lasts 5.5 to 6 months. The stock is driven into the mountains between April 1 and May 1 in most years, and the animals start for the valleys from early September until the middle of November, when in the majority of cases practically all that are wintered on the farms are off the range. Relatively few men who have cattle as a farm enterprise intentionally keep any of the stock on the range the year round.

When the animals reach the bottoms in the fall, good yearlings (16 to 18 months old) weight from 700 to 800 pounds per head, sometimes more. The 2-year-olds usually weigh from 850 or 900 to 1,000 pounds, and the 3-year-olds from 950 to 1,100 pounds per head. The stock cows weigh from 900 to 1,100 pounds though some come out quite fat at 1,200. They are sold practically always by the ninth year, and in general any cow coming out fat not having had a calf, is disposed of at once. Most men reckon on disposing of 6 to 7 mature animals a year (2.5 to 3.5 years old) for every 10 stock cows. Most of the animals are Shorthorn and Hereford grades; though there is some Devon, in a few cases Jersey blood, and occasionally evidence of Holstein, though these breeds are comparatively rare with range stock. The smaller stockmen do not supply bulls, depending on those of the larger owners to serve their cows. Most men make

two trips with salt in a summer, a day being needed for each trip. They give each head from 3 to 4 pounds of salt during the range season, or half to two-thirds as much as the animals are reckoned to need.

Most of the range cattle marketed each year are sold directly from the range or after a short time on pasture in the irrigated bottoms. As the animals come out of the mountains they are put on fall pasture until enough fat stock is on hand to sell. Those to be sold, of course, are given the best pasture if there is any preference. Alfalfa or beet tops or a combination of these two is preferred for such stock. Many men hire alfalfa pasture for $2 per acre, beet tops for $1, or the two for $1.50 per acre. Some men rake and haul the beet tops and feed them on sod land, though this is not usual. Most stockmen are of the opinion that the animals are better able to gather their own feed. A 3-year-old steer on full beet-top feed eats from 135 to 175 pounds a day and wastes 30 to 50 pounds. A 20-ton beet crop leaves 8 to 10 tons of tops and crowns on the ground, and an acre is reckoned to carry three 3-year-old steers for about a month. Beet tops to steers for fall sale makes them very fine and sleek, especially if they are grazed on alfalfa. The farmer, if he hauls the tops, aims to give 40 to 60 pounds per head per day. They are an especially good feed for cows to be turned off in the fall, and considering their food value they are priced at a figure which seems ridiculously low. Dry-land grain stubble is often rented for fall pasture for 50 cents per acre, and irrigated grain stubble for $1 per acre.

The fall price for fat stock is usually at the rate of 6 to 6.5 cents per pound, though most animals are sold by the head, a practice which should be abandoned. Steers with an extra good finish command 7 cents at times. Stock sold fat in the spring usually brings 6.5 to 7 cents unless the market is below normal. The bulk of the cattle from northern Utah are shipped to the coast, while those from the southern part of the State are sent east to Omaha or Kansas City. The best time to market stock is stated to be in June, but this necessitates heavier winter feeding than most farmers care to give. When this is done, the animals are put on good early range until June, if such range is available. There are a few farmers who make a practice of feeding heavily through the winter for spring sale, and at a number of places large numbers are so fed on beet pulp and alfalfa hay, but not as a farm activity. Men with more feed than they need often buy up yearlings and 2-year-olds for winter feeding and sale as range feeders in the spring if they can not get the necessary range themselves. Some men make this phase of the business something of a speculation.

WINTER FEEDING OF STOCK CATTLE.

FEED REQUIREMENTS.

The winter feeding season ordinarily lasts from 4 to 5.5 months, but sometimes 6 months, depending on the locality and the weather. Stock cattle are given free run of the fields all winter by virtually all farmers. As a rule, only the calves are given an appreciable amount of shelter. Generally they are put in a field or yard by themselves, usually with a shed more or less inclosed and are more carefully looked after than older animals. Most men find that it does not pay to permit the calves to get stunted through neglect during the first winter, and special attention is given them to secure more growthy stock for sale the second or third year. Very often the calves are fed on alfalfa hay, from five-eighths to three-fourths of a ton per head, depending on the severity of the winter and the length of the feeding season. The operators find that this pays. Others feed them the finer wild, or slough hay, but they do not get as good results. In the northern part of the State the full winter feed is not usually given until the first of December or the latter part of November. A couple of loads of wild hay are fed per week to each 80 to 100 head for 2 or 3 weeks previously while the stock is picking up most of their feed in the open fields. As one goes southward the full feeding period is delayed, until in the vicinity of Provo it does not begin until about the middle of December.

With a feeding period of 5 to 5.5 months (and not many farmers in northern Utah have to give full feed for more than 5.5 months except in occasional winters) a man calculates to feed about 1.25 tons of wild hay to the yearlings, not quite 1.5 tons to the 2-year-olds, and 1.5, or a little more, to the stock cows and any backward 3-year-olds which may have been kept over. In severe winters when the weather stays crisp and cold for the greater part of the time, the above amounts are exceeded somewhat. In addition to the hay the stock is fed all the straw they will eat. Most feeders lump the yearlings and 2-year-olds with the older animals and reckon on 1 to 1.5 tons of wild hay per head in the herd when they have a season of 5 to 5.5 months full feed. The amount actually fed varies with the supply on hand, the proportion of yearlings to older animals, and the season. In sloppy weather the stock does not eat as freely as when it is cold and crisp. The aim is to feed no more than the animals will clean up, but to keep them growing.

When plenty of warm water is handy a man can winter his cattle with very little hay, and they can be brought through to spring in fair condition, but this management is not favored if it can be avoided. A ton of barley straw, if not too coarse, or the same amount of wheat straw, is reckoned to be equal to about a third or

two-fifths of a ton of wild hay, and a ton of oat straw to be worth one-half to three-fifths of a ton of this hay for feeding purposes. Alfalfa hay is deemed twice as good a feed as wild hay. In northern Utah slough hay sells for $4 to $4.50 per ton, and straw for $2.50 to $3 and alfalfa for $7 or $8 to $10 per ton in most years. The buyer does his own hauling. The stock is often given free access to the straw stack, but they then waste more than they eat. The better farmers, when they wish to use their straw to good advantage, haul it to the fields and spread it out on the snow. Hay is practically always fed in racks.

LABOR USED IN WINTER FEEDING.

The daily duty of a man and team in winter feeding varies greatly with the conditions under which the work is done, as well as with the man. When the stock is in adjacent feed lots within a circle of half a mile, with free access to the straw stacks, and the hay does not have to be hauled over three-fourths of a mile, a man with a team is expected to feed 250 to 300 cows, calves, and older stock through the winter. It takes a very good man to feed 300. Basket racks are used altogether for the hauling and not over 1,500 pounds are taken per load. When the straw is hauled and spread on the snow under the above conditions one man feeds 150 to 200 head. With a haul of up to 2 miles for straw or hay, the straw being spread out, one man can not feed more than 150 head, and he has to be an active hand to do as much. The ordinary man rarely feeds more than 100 to 125 head under these conditions. One operator fed 130 cattle (of which 30 were calves) and 40 horses in a 9-hour day during the winter of 1914–15. Part of his hay and straw (which usually was spread on the snow) had to be hauled 4 miles. He stated that he could not expect to get the same amount of work done with less than two hired men.

WINTER FEEDING FOR BEEF.

The fact that some operators feed for beef through the winter has been mentioned. This is not done to a very great extent on the Utah farms. Adult animals so fed for spring or early summer sale are given 30 to 40 pounds of alfalfa hay a day, being reckoned to consume 2.25 to 3 tons in a feeding period of 5 months. With the lighter hay feed considerable straw is also given; with the heavier hay ration very little straw is fed. A 3-year-old steer is expected to gain 150 to 200 pounds by spring, sometimes a little more. With alfalfa hay at $10 per ton there is little or no money in this operation. With a gain of 200 pounds, and sold at 7 cents, a 1,200-pound animal brings $84. If worth but 6 cents in the fall at 1,000 pounds, there is a gain of $24 in value. Two and a half tons of hay at $8 to $10 makes a feed cost of $20 to $25 without charging the cost of labor, interest,

etc. After allowing full value for the manure, most men do not figure that this activity pays if anything is to be allowed for labor.

RANGE CATTLE IN PROVO AREA.

The farmers in the vicinity of Provo who are turning to range cattle as a side line are those who own or can get the use of some of the lowland along the lake. This is very good pasture for such stock, and considerable coarse, wild hay is cut for winter feeding. To date this low shore land does not appear to be used to its full capacity. Men who have recently adopted range cattle as an enterprise have bought the stock and grazing permits of others or have bought or leased range land outside of the National Forests. In the nature of the case, only in rare instances do range cattle constitute a practicable side line for the small operators unless they can secure the use of some of the low lake-shore pasture. It should be noted, however, that the labor required by range cattle is almost entirely supplemental to that in crop growing. General farmers able to adopt the above enterprise thus have work for the idle winter months when their time is not worth a great deal. With other conditions favorable, a man could well afford to price his winter labor on cattle at a low figure.

BABY BEEF.

A promising enterprise in connection with the cattle enterprise would seem to be good feeding and care of the calves for baby-beef. With abundant alfalfa hay and some grain the first winter the animals should be in fine shape for sale early the following summer, or even in the second fall from very good range. The increasing demand for this class of beef and the high price received for it merit close attention from the Utah farmer. Disposal of stock in this way will vastly increase the capacity of the range for stock cows, and nearly or quite as much is secured for good baby beef as for 2-year-olds under the present system. An 800-pound 2-year-old steer at 6.5 cents per pound brings $52, while baby beef made under the above system sells at 14 or 15 months for around $50 per head. In this enterprise good grade cows should be used, and a pure-bred bull. Men now making baby beef have the calves come in March or April, wean them in September or October after spending the summer on fairly good pasture, and then place them on a feed of alfalfa hay and a mixture of barley and oats. The grain feed is gradually increased until by the following May each animal receives from 6 to 10 pounds per day. They are sold in May and June. The receipts per cow in the breeding herd are practically twice as large, and the money is turned over twice as fast on the same size of investment as when the beef is made on the range and sold at 2½ years of age. Although the feed the first winter costs more than in the old

system, the expense up to the time of marketing the product is less. In the present condition of the range industry in Utah such a plan as the above seems the only way out if more operators are to engage in that enterprise as a side line. Such an enterprise forms a valuable addition to the farm business in the hands of a capable operator who can make use of the range.

UNCERTAIN MARKETS AND HIGH TRANSPORTATION CHARGES.

The outstanding fact in irrigated agriculture in Utah is the dependence of a large proportion of the farmers on a distant and extremely uncertain market for the disposal of a bulky and perishable product. This has been especially true in the past 10 years, when the orchard area, particularly the peach area, has been greatly increased. A considerable percentage of the peach orchards are on small farms, less than 27 acres in size and averaging less than 18 acres. Under the existing market conditions dependence primarily on fruit by the operators of small farms in this region (and other sections similarly situated) is not safe. This statement applies with added force to the small peach grower. The great weakness with the peach crop lies in the fact that it reaches the market usually in the same week as does that from southern Michigan. The Michigan growers have a big advantage in their lower freight charges. Their crop must be poor or a failure before the Utah growers are able to make much profit. An uncertain market, uncertain crops, and high shipping costs are a severe handicap to the Utah orchardist.

The uncertainty of the market for Utah fruit is characteristic of that for all perishables. The Office of Markets of the United States Department of Agriculture is making rapid progress in its work on the markets for perishable products, but however great its success the other weak points in the system of the Utah orchardist will persist. Although the small-fruit grower who does not depend on peaches is less precariously situated than his neighbor, all the small orchardists are operating with a factor of safety which is entirely too low. In case of crop or market failure they have little else to depend on. Owing to a late freeze the fruit crop in Utah Lake Valley in 1915 was almost a total failure. The small operator suffered accordingly.

Because of the high transportation charges,[1] the operators in the Intermountain country who ship to distant markets should rely so

[1] The freight charges on Utah fruit sent from the Provo area to the Eastern markets and the charges for refrigeration are typical for the State. From Provo the grower pays 90 cents per hundred pounds to get his fruit to Kansas City, Omaha, or Missouri River common points and $45 per car for refrigeration. To Mississippi River common points the freight is 95 cents per hundred and $50 per car for refrigeration. To Chicago these charges are $1 and $55. To Texas common points the freight charge is $1.06 and the refrigeration $60 per car. To the Atlantic seaboard the freight charge is $1.558 per hundred and the refrigeration charge $65 per car. (Freight rates supplied by the Interstate Commerce Commission. Refrigeration charges from Provo were obtained from a large shipper of Utah fruits.)

The average gross weight per packed bushel of apples from Utah County is 52 pounds, the container weighing 6 pounds. The average gross weight per box of pears is 51

far as possible on concentrated products of a high value for their bulk. In former years when little but beef, mutton, and wool was shipped from the State, the conditions of the market were quite fully met. The possibility of a greater dependence on beef has been indicated. Should an extension of the canning industry give a good market for certain crops in the Provo area the situation of the farm operator will be much improved. The same will result if the creamery business undergoes the expansion which its friends anticipate.

In either instance the opportunity for diversification in this area would be much greater than at present. In the first case crops of a relatively high value per acre can be grown; to a considerable degree the labor on them will be noncompetitive with labor on enterprises now followed; and within reasonable limits the regular labor at present only partly occupied can attend to all but the harvesting. In the absence of this opportunity possibilities of diversification with the present range of farm enterprises should receive careful attention. A valuable means to this end would be offered by an expansion of the creamery business, and along lines largely noncompetitive with the current activities on most farms where a dairy herd or an enlargement of the existing herd will prove practicable.

The larger orchardists who place considerable reliance on general crops are more favorably situated, particularly those who have only limited areas of peaches and depend more on the other tree fruits, which give better returns. A factor of no small importance in this result is the lower harvesting cost of these fruits. But the operator who utilizes orchard enterprises as an important though not the primary activity, or as a filler to round out the business as a whole, is the one whose system more nearly fits the existing conditions in this region. This would seem to be the only system on which fruit of any kind should be produced by the great majority of Utah growers. The man with a special market for his product or the occasional orchardist of unusual ability, particularly when he grows the more profitable fruits, perhaps can afford to concentrate on orchard enterprises, but he takes a gambler's risk. A man with small or moderate capital can not afford to run such a chance.

TOWN-DWELLING FARMERS.

A striking fact in Utah agriculture is the number of farm operators who live in town but have their farms at varying distances in

pounds, the container weighing 5 pounds. A case of peaches averages 21.5 to 22 pounds gross and a case of prunes 26 pounds gross. Usually very little Utah fruit is shipped east of Chicago.

Two bushels of fine Rome Beauties were bought near Provo in the fall of 1914. They cost 62.5 cents per bushel, packed and ready for shipment. They were sent by express to Washington, D. C., at a cost of $1.98 a box and thus cost at the house door $2.505 per bushel. If shipped in bulk the cost for transportation would have been 91.85 cents per bushel. These apples packed 76 and 80 to the bushel, and fruit of similar quality on the Washington market sold that winter for $4.25 to $4.75 per bushel. At fruit stands such apples sold for 10 cents each.

the country. This is in large measure a heritage of the Indian days, when communal settlements were necessary for protection, and a man's land lay outside the stockade in more or less intermingled strips, after the fashion of mediæval European agriculture. Much the same system still holds in parts of Europe, as well as in other parts of the world. When all the land farmed is in one piece, or where the fields are located quite close together, the inconvenience of this arrangement is not so pronounced. But some farmers in this region have land lying in three or four different directions and none of it as close as 2 miles to the home. For example, a man will have a field 4 miles from town in one direction, another field 3 miles away in another, and the remainder as far or farther away in a third. The roads may be so planned that the quickest route to any other field from one in which work is going on is back to town and then out. Under such conditions the time wasted on the road is a serious handicap to successful farm management.

Even with the least inconvenient arrangement, that of having all the land in one block or in neighboring blocks at a distance of 1 or more miles from town, many small economies are not possible. When the fields are widely separated the problem is intensified. Few men in the former situation have their land as close as 1 mile to town. A number from whom farm management records were secured live from 3 to 3.5 miles from the farms, sometimes farther. Each day during the busy season they lose from an hour and a quarter to two hours on the road. They rarely return for dinner in the middle of the day, but when they do so the time lost is doubled.

These men find it practically impossible to use cows, hogs, or chickens as a side line. They therefore buy a pig or two in the spring to fatten for home use and sometimes have a few hens at the house, but their grocery bill for eggs and poultry often amounts to a large sum in the course of the year. A flock sufficient to supply the family throughout the year would be a serious nuisance to the neighbors in town, as would the pigsty. One team is kept in town practically the entire year, as is the cow as long as she is fresh. She is grazed on hired pasture throughout the summer, driven out in the morning and back at night. The milk bill for a large family often is a considerable item after the cow goes dry. The remainder of the stock—that is, practically all the work horses or colts—is kept at the farm. During the winter about two trips are made per week to look the animals over, salt them, and see to the feed. For a part of the winter a considerable portion of the feed is picked up on the beet land if it is not fall plowed or on that part of it which is not so plowed.

The farm garden usually is a very minor enterprise, if present at all under these conditions, and a considerable part of the family living, which otherwise would be raised in spare hours during the sum-

mer, is bought over the grocery or market counter. In many cases the quality of the vegetables bought is not as high as that of those raised on the farm. The variety is apt to be somewhat more limited than if grown in a farm garden. As a rule, a smaller quantity of fruit and vegetables is "put up" during the summer for winter use than when a good garden is available. This is an item of far greater importance than sometimes is supposed. A study made by the Office of Farm Management in other sections of the country indicates that about 63 per cent of the food consumed by the farm family is produced on the farm.[1]

When the operator lives in town several miles from the farm he neglects many seemingly insignificant sources of food supply which in the aggregate form a large sum. By no means the least important is the item of animal foods, or animal products consumed. These are the most costly and constitute nearly three-fifths of the total value of the food supply. Often they are conspicuously lacking in the contribution made by the farm to the family living under the above conditions. Considerable money which otherwise would be available for various comforts and conveniences goes for their purchase. On the score of farm management there seems no doubt that the man operating his farm as outlined above is doing so at a serious sacrifice.

There is another side to this question, however. The farmers interviewed readily agreed as to the shortcomings of their system. The wives did the same, but presented facts that put an entirely different aspect upon the case. Many of the families live in town because of the school facilities. In those sections where the country schools have been brought to a high state of efficiency, and they are very numerous in Utah, the farmers habitually live on the farm. Many of those who live in town do so because of the distance the children would have to travel to the country school and because of the better schooling often secured in the town schools. In a severe winter considerable time is lost from the rural school in many cases, particularly by the younger children. Furthermore, the urban conveniences and the urban social advantages have a strong appeal, especially to the wives, and this seems to be as general a reason for living in town as superior schooling, perhaps more general. These wives have a strong argument, as is attested by the fact that they do live in town. When this argument is added to that of the school facilities, their case is strengthened considerably.

It is seriously open to question, however, whether the urban environment, on the whole, is the more wholesome for the children. Certain educators strongly believe that it is not. In general the rural sociologist agrees with the educators. At the same time, the farmers state that they profit but little by the social advantages of the town, and the children less, so far as real advantages are concerned.

[1] Farmers' Bulletin 635, What the Farm Contributes Directly to the Farmer's Living.

There is small ground for argument on the question of the town school as compared with the country school in some cases, nor on the question of getting the children to school during the winter. The social side of the question is one for the rural sociologist and the specialist in rural organization to study.

The farm-management side of the proposition seems largely undebatable. It seems probable, however, that the greater opportunity more fully to utilize the resources of the farm when it is also made the site of the home, would far more than offset the cost of keeping a horse with which to send the children to school, and the trifling corral rent for stabling the animal while school is in session. Indeed, the main need for the horse is in severe winter weather when the farm draft is largely idle, and probably no extra horse would be required in many cases. The season when the school question is most pressing being that when farm work is most slack, little work other than hauling manure being done then, would seem to indicate the feasibility of the farm operator attending to this chore himself if some other arrangement could not be made.

IMPORTANCE OF RAISING HOME SUPPLIES.

In regard to more full utilization of the farm resources for direct contributions to the family living, considerable still remains to be done by many of the operators in this section in common with fully as large a percentage of the farmers in other parts of the country. This phase of the farm activities is of peculiar importance to Utah farmers. A considerable proportion of them depend on a distant and uncertain market for the disposal of their products. Good or fair prices received for fruit one year may be and often are offset by poor prices for one or more years. This condition is likely to become increasingly prevalent as the area of fruit at present not in bearing reaches maturity, particularly in regions nearer the consuming centers. The farm garden in particular should receive much more attention, and the surplus therefrom, as well as surplus fruits, should be canned if not adapted to preservation otherwise. Marked improvement is discernible in this regard since the start of Boys' and Girls' Club Work in the State. The work of the Agricultural College and the county agents along this line should meet with the ready cooperation of all the farm operators and their wives. Much can be learned, and valuable economies practiced as a result. By more attention to the above points money which otherwise passes over the grocery counter will be available for other uses, not the least important of which are conveniences for the home, and savings to meet the strain of that lean year, which is sure to recur more or less frequently.

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